Complete Statement
of
Michael G. Marschner

Director
Division of Utilities and Solid Waste Management
Frederick County, Maryland

THE SUBCOMMITTEE ON WATER RESOURCES AND ENVIRONMENT

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
UNITED STATES HOUSE OF REPRESENTATIVES

ON

Water: Is it the "Oil" of the 21st Century?

MR. CHAIRMAN AND DISTINGUISHED MEMBERS OF THE SUBCOMMITTEE:

I am honored to be testifying before you on the very important and timely subject of water supply resources. I am very pleased that this subcommittee is interested in hearing about the water resource problems facing the nations water suppliers, particularly the smaller water utilities like those serving communities in Frederick County, Maryland.

The quality of drinking water provided by public water supply systems in the United States is second to none. Congress, through the Safe Drinking Water Act (SDWA), has made sure that the water Americans receive from their public water supplies is not only safe to drink but is also healthful. The water supply industry continually improves the quality of drinking water as new scientific information regarding potential health risks associated with natural and manmade pollutants become available. We are fortunate that Americans place such a strong emphasis on the quality of the water they drink. This has helped ensure that the water supply industry has the resources to continually improve the quality of their product. This pure basic product, to a great degree, is why Americans enjoy such a high standard of living, effectively free from waterborne disease.

Unfortunately, in the pursuit of improving the quality of our nation's drinking water, we may have neglected to properly plan, fund, and construct the infrastructure needed to insure that adequate quantities of water are available continuously for use by our region's water suppliers. The need for such infrastructure is frequently only exposed when severe droughts occur and communities are subjected to water use restrictions. Often the community and political interest in the water supply crisis diminish as soon as water use restrictions are lifted.

Like so much of the nation's infrastructure, most citizens simply want their water supply systems to work correctly, producing safe, palatable, low cost drinking water, without interruption. When interruptions do occur in water supply systems, it is usually due to mechanical problems that can be corrected quickly, typically within hours. However, interruptions in water supply caused by severe drought can take several months, or even years to correct. During this time, the community may have very restrictive limits placed on their water use. Water use restrictions and the water supply shortages that cause them, are not just an inconvenience; they can greatly impact the communities' ability to maintain their economic vitality. Water use restrictions necessary to prevent widespread outages can have serious impact on commerce. Without an abundant water supply to meet the public health and economic demands of our community, the high quality of our nation's water supply ceases to be important.

In the Mid Atlantic States, many communities have become accustomed to having an almost limitless supply of water. However, the multi-year drought that began in 1999 and ended in 2002 identified deficiencies in numerous water systems' capacity to supply water during drought.

A LOCAL PROBLEM IN FREDERICK (or the Beginning of a Regional Problem)

As with much of our nation's infrastructure, early indications of deficiencies often begin in small isolated areas. In Frederick Maryland, rapid increases in population over the last 20 years led to the over-allocation of the City of Frederick's water supply. The City's water supply problem caused an abrupt halt to the sustained growth that had been occurring within the City. In some cases businesses that were planning facility expansions had to delay such action or plan expansions elsewhere. The events that caused of the City's water supply problems were incremental, occurring over a period of almost 40 years. These incremental events are briefly summarized below:

- Following the 1966 drought the City failed to recognize the limitations of its water supply system. Individuals responsible for the City's water supply at that time reported taking all of the water available in Linganore Creek by building a temporary dam across the creek. This should have been an early warning to the City that the safe yield of its primary water resource was severely compromised.

- Due to a lack of local support and congressional appropriation, the construction of a planned water supply reservoir located on the Monocacy River (Sixes Bridge) did not proceed.

- Fortunately in 1970 a private development constructed an earthen dam along Linganore Creek that impounded 833 Million Gallons (MG) of water, augmenting the City's water supply and establishing a source of supply Safe Yield equal to the City's Water Treatment Plant Capacity.

- However, in 1976 the Maryland Department of the Natural Resources issued the first Water Appropriation and Use Permits for the City's Linganore Creek and Monocacy River water supplies. Both permits included flow-by provisions to protect the downstream users and water resource ecology. Unfortunately the flow-by provisions in these permits seriously reduced the City's ability to withdraw water during periods of drought. The City failed to recognize that the flow-by provisions greatly reduced the supplies' safe yield.

- Between 1976 and 1999 the City of Frederick experienced a period of substantial growth as more people wanted to live in smaller, lower density communities.

- During the summer of 1999 drought conditions caused the City to violate the flow-by provisions in its water Appropriation and Use Permits to meet the water demands of its residents.

- In December 2000 Frederick County, the City of Frederick and owners of the private Lake Linganore executed an agreement, that among other things, insured that enough water would be released from the lake to satisfy both the City's WTP capacity and the permit's minimum flow-by requirement. This established a finite safe yield for the City's largest water treatment plant. However, the City still did not have enough water resources to meet the needs of its community.

- So in July 2002, facing an even more serious drought than that which occurred during 1999, the City of Frederick executed a consent order with the Maryland Department of the Environment (MDE) allowing the City to reduce the flow-by requirements for its Monocacy River water supply.

To solve the City of Frederick's water supply problem Frederick County is expanding its Potomac River water supply to meet the City's current and future needs. To deliver water to the City of Frederick from the Potomac River, the County has to construct approximately 14 miles of 42-inch diameter water transmission line and expand its New Design Road Water Treatment facility. The combined cost of these projects is expected to exceed 70 million dollars. Funding for these treatment and transmission projects is coming from the local governments.

The City's current water supply problem might have been prevented if local and state governments had better understood the limitations of the water supply and had pursued projects to augment the City's water supply sources. It is possible that this same scenario may occur with other users of the Potomac River water supply. Although the Potomac River resource, and its allocation for use as a public water supply, is under much greater scrutiny by the MDE and the Interstate Commission for the Potomac River Basin (ICPRB), current projections by the ICPRB indicate that the present reservoirs in the Potomac River basin may not be able to satisfy the projected offstream and instream water demands 30 years from now. In the ICPRB's most recent report on this issue (ICPRB Report No. 00-5, *Water Supply Demands and Resource Analysis in the Potomac River Basin*), the ICPRB indicates that the current system of water resources from the Potomac River is adequate to meet the high population growth

estimates for water demands in year 2020. However, based on demand projections for the year 2030, under a repeat of the historical drought of record, the water resources of the Potomac River would be nearly depleted. This means that the established Safe Yield of the existing water supplies that rely on the Potomac River may be reduced, as we get closer to the year 2030.

Defining the Safe Yield of a Public Water Supplies

The safe yield of a public water supply is the maximum dependable draft that can be made continuously on a source of water supply during a period of years during which the probable driest period, or period of greatest deficiency in water supply, is likely to occur[1]. The Recommended Standards for Water Works further defines surface water source water quantity requirements as follows:[2]

- Be adequate to meet the maximum projected water demand of the service area as shown by calculations based on the **Extreme Drought of Record** while not significantly affecting the ecology of the water course downstream of the intake,

- Provide a reasonable surplus for anticipated growth,

- Be adequate to compensate for all losses such as silting, evaporation, seepage, etc.,

- Be adequate to provide ample water for other legal users of the source.

The **Extreme Drought of Record** for a particular water source is based on historical hydrologic events. When evaluating historical data to determine the Safe Yield of a source for use as public water supply, it is important to understand that even 100 years of daily flow data from a river or stream reflects only a very small period in geologic time. One must recognize that the historical Extreme Drought of Record is not the most severe drought that will occur during a period of use of the water source.

It is for this very reason that water supply systems are planned and developed to be able to meet the calculated maximum daily water demand during the Extreme Drought of Record. Should a more severe drought occur than that which had been previously recorded, the water supplier must be able to maintain an

[1] Source: Glossary - Water & Wastewater Control Engineering, Prepared jointly by the American Public Health Association, American Society of Civil Engineers, American Water Works Association, Water Environment Federation.

[2] Published by The Great Lakes Upper Mississippi River Board of State Public Health & Environmental Managers

acceptable minimum supply through the imposition of mandatory water use restrictions. This design requirement effectively provides a design safety factor for water supply. Once such a more severe drought has occurred it is incumbent upon the water supplier to augment its supply to meet the projected maximum daily demand based on the new (more severe) recorded period of greatest deficiency in water supply. Failure to follow this doctrine can seriously jeopardize the water supply adequacy and the public's health and well-being.

Many individuals believe that more aggressive water conservation programs should be put in place before we plan and fund major new water supply projects that will augment our water supplies. Although water conservation programs and commodity price structures that reduce water consumption will continue to be necessary in the future, such concepts will not ensure a continuous supply of source water to the utilities that must meet the needs of a growing population and expanding industrial base.

As a result of multi-year droughts that occurred forty years ago in the Northeastern United States, the 89th Congress recognized the importance of assuring adequate supplies of water for the growing metropolitan centers of the United States. Public Law 89-298 provided for the planning and construction of a major system of reservoirs to be located in the Northeastern US. Several were anticipated to augment the Potomac River. After 10 years of study, only a few of the projects originally envisioned were being formally programmed for construction. The most significant of these projects was the Bloomington Dam and Lake for the Potomac River Basin. Ironically if one of the other reservoir projects (which was to be located in Frederick County) studied by the Corps of Engineers had been completed, the City of Frederick would probably not have a water supply problem today.[3]

In 2002 the region encountered a drought worse than the multi-year droughts of the 60's that precipitated the action by the 89th Congress. Today we have substantially more people, business and industries relying on the Potomac River water supply than that which existed forty years ago. Only parts of the water supply projects anticipated have been deployed to augment the Potomac River water supply. The single most significant construction project (Bloomington Dam and Lake) is now more than 20 years old and no additional projects are planned. Based on the ICPRB's most recent analysis and the time it takes to plan, fund, permit and construct additional water storage reservoirs it appears that we need to start planning the infrastructure improvements needed between 2020 and 2030 immediately.

[3] The Sixes Bridge Dam and Lake project proposed in Frederick County would have provided 39,000 acre feet of water for water supply use. The estimated Safe Yield of the project was 85 MGD, more than 8 times the City of Frederick's current maximum day demand.

The value (and the cost) of our water resources will continue to increase as the competitive need for water grows. Providing infrastructure to ensure that abundant water resources are available is good for most if not all sectors of the economy. Water shortages on the other hand, particularly those occurring over multiple years, have had, and will continue to have, severe impact on commerce and potentially the public's health and well-being.

RECOMMENDATIONS

I am sure that there are numerous experts better qualified to testify to this committee and explain what steps should be considered to properly plan our water supplies to meet growing demand. My recommendations are rather simple but are based on more than 20 years of managing the operation of public water supply systems.

1. The committee should remember that when a drought occurs and the water utility does not have enough water to distribute through its network of pipes, contamination of the water supply will occur, which will jeopardize public health.

2. Embracing drought supply "plans" that rely on the imposition of water use restrictions, in place of actual "infrastructure" that augments the source of supply, will not ensure that the future population's water supply needs are met.

3. The committee should understand that the most severe drought that an area will encounter has probably not yet occurred. The drought of record for the Potomac River is based on only 108 years or recorded hydrologic history, out of a geologic period that extends over millions of years.

4. Don't let the drought of 2002 fade into history without taking action to start the augmentation of the water supply infrastructure for the Washington Metropolitan Area water supplies and the communities upstream that rely on the Potomac River.

5. Be prepared to balance the need for water supply augmentation projects against the impacts to the environment, which such projects may have. But place the water supply needs for public health protection and your citizens well being above all other considerations.

6. To the extent that the federal government can, subsidize the cost of projects that will ensure adequate regional water supplies. The local governments and utilities are already tasked with expensive programs to enhance water quality and ensure the security of the infrastructure that provides this vital resource.

I thank you for the opportunity to provide the committee my comments. I will try to answer any questions the Committee may have regarding this my testimony or the water supply issues facing local governments.